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10/676,330	09/30/2003	A. Daniel Feller	42P17275	6479

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INTEL CORPORATION
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EXAMINER

GEORGE, PATRICIA ANN

ART UNIT	PAPER NUMBER
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1792

MAIL DATE	DELIVERY MODE
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01/02/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/676,330

Applicant(s)

FELLER ET AL.

Examiner

Patricia A. George

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 30 June 2006.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-10 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

Claim 10 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Independent claim 1, recites a surfactant comprising an ethoxylate ether, then dependent claim 10 recites the same surfactant is one of broader groups, such as ethoxylate, or glucolic acid (a carboxylic acid the ethoxolate could be derived from).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 10, the phrase "wherein the surfactant comprises at least one of glucolic acid, ethoxylate, and laurel ether" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d). Specifically, it is unclear if applicant is claiming a surfactant that contains one of glucolic acid, one of ethoxylate and one of laurel ether (i.e. all 3

required), or a surfactant that contains one of glucolic acid, ethoxylate, or laurel ether (i.e. just 1 required).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6, and 8-10 are rejected under 35 U.S.C. 103 as being unpatentable over Wang et al. (6,362,104) in view of Kato et al. (6,340,374), and Minami Fukugaku (JP 2000-352443; pub 5/2002) evidenced by Sigma Aldrich Fine Chemicals (Engineering Polymers (cont.); Surfactants; 5/2003; <http://web.archive.org/web/20030509223455/http://www.sigmaaldrich.com/img/assets/3900/Surfactants.pdf>).

Wang teaches slurry comprising: abrasives (as in claim 1) such as silica, or alumina (as in claim 8) (see col. 2, lines 23-37); pH of the slurry at 2-11, which encompasses applicants range of between about 4 to 8, as in claim 1 (see col. 10,

lines 26-27); a corrosion inhibitor, such as BTA (as in claims 2 and 3) (see col. 8, line 47); a buffer system comprising an organic acid such as acetic, citric, or oxalic acid (as in claim 4 and 5) (see col. 8, lines 55-58), a salt of the organic acid such as potassium acetate (as in claim 4 and 6) (see col. 2, lines 23-37); and a surfactant (see col. 9, lines 40-44). Wang teaches periodic acid (see col.4, line 51) at a rate of 0.1 to 20 wt % (col.5, line 14) which appears to overlap the claimed units of a molar concentration from about 0.004M to about 0.006M, as in claim 1.

Although the reference of Wang does not explicitly disclose the concentration of periodic acid in the claimed units of molarities, it would have been obvious to one of ordinary skill in the art at the time of invention was made, to make the necessary conversion of weight percent, as Wang, when determining the molar amount of periodic acid, as in applicants' limitation, because all ingredients of the slurry would be known and calculative. Further, it would have been obvious to one of ordinary skill in the art at the time of invention was made, to adjust the quantity of periodic acid, for desired results, as applicants' limitation, when forming the slurry, as Wang, because the invention of Wang illustrates the concentration of periodic acid may be adjusted to achieve desired results, evidenced by the range of Wang.

Although Wang teaches applicants' preferred range of abrasive (see applicant specification para 15) and rejection above, Wang does not teach applicants' amended range of 26 to 30 percent abrasives.

Kato teaches slurries may have from 1 to 40% by weight silica and cerium oxide abrasive particles (see abstract).

It would have been obvious to one of ordinary skill in the art at the time of invention was made, to modify the CMP slurry with abrasives, as Wang, to include the range of 1 to 40%, as Kato, because Kato teaches the grains increase the polishing rate, and the polishing rate is related to the device productivity therefor it is a highly desirable change (see background).

Although, the modified invention of Wang teaches use of surfactants, the invention of Wang fails to teach applicants' specifically claimed surfactants, as in claims 1, 9, and 10.

Fukugaku et al. teaches use of anionic surfactants such as organic compound Perfluoro-alkyl BEDAIN, a perfluoro-alkyl ethylene oxide addition product, Perfluoro-alkyl oligomer, perfluoro-alkyl carboxylate, Perfluoro-alkyl quarternary ammonium salt (see para. 0009), which includes applicants' claimed chemistry for a surfactant, are used to solve problems encountered by RIE (see Problems to be solved...). Sigma Aldrich Fine Chemicals (Engineering Polymers (cont.) provides further evidence that applicants' specifically claimed surfactants are shelf ready, and known stabilizers for micro-emulsions, see attachment.

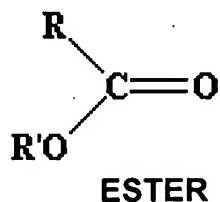
It would have been obvious to one of ordinary skill in the art at the time of invention was made, to modify the invention of CMP slurry, as Wang, to include

applicants' specifically claimed surfactants, because Fukugaku et al . teaches they provide enhanced processing to RIE, and Sigma Aldrich Fine Chemicals provides shelf ready specifically claimed surfactants, which are known to stabilize such micro-emulsions.

Response to Arguments

On page 2, applicants state they disagree with examiner's understanding of ethoxylate, and fails to point out error in the explanation provided in the 112 rejection, filed 6/14/2007. Further explanation follows.

Ethers and esters are not the same. See Fromm page 4, area circled, where it explains that ethers are not to be confused with compounds such esters.

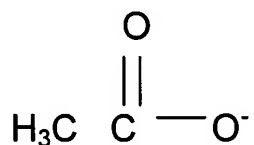


An ester has the general formula R-COOR' (the carbon is double bonded to one oxygen atom and single bonded to another), the alkyl group (R') is always attached to the an oxygen atom. The naming convention names the second word in the name as derived by adding the ending -oate to the stem of the acid name (-oic in the acid name is replaced with - oate). See Fromm, Ester, page 1 of 9.

An ether has the general formula of R-O-R' (notice no carbon, no double bond) . The naming convention is by naming the radical on either side of the oxygen atom, and adding the word ether. In the case an ether is a oxy derivative of the hydrocarbons, ethers are named alkoxy substituent , always appending ether. See Fromm, Ether, page 1 of 9.

The molecular structure for ethoxylate (similar to ester above) includes a carbon atom double bonded to oxygen

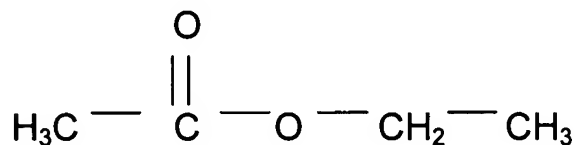
(i.e xylate = salt of carboxylic acid) is:



Whereas the molecular structure for ethoxide (similar to ether above) is:



A functional chemical example would be a comparison of: ethyl acetate, clearly an ester by the structure provided by Fromm;



and (di) ethyl ether is clearly an ether by the structure provided by Fromm above.



Applicants argue, on page 3, that none of the previously applied references teach ethoxolate ether, but fail to point out how the chemistry applied in the rejection filed 6/14/2007, is in error. The reference of Fukugaku, was applied to teach applicants' specifically claimed surfactants. If applicant has evidence of why the surfactants of Fukugaku fail to be written on the claimed ethoxolate ether, examiner would be happy to take such a submission into consideration. Absent such evidence, the rejection stands. See above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Application/Control Number:
10/676,330
Art Unit: 1792

Page 9

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia A. George whose telephone number is (571) 272-5955. The examiner can normally be reached on Mon. - Fri. between 8:00 am and 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



PAG
12/07

Patricia A George
Examiner
Art Unit 1792



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